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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,795	02/15/2002	Frank Olschewski	21295/41	5943

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EXAMINER

SEALEY, LANCE W

ART UNIT	PAPER NUMBER
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2671

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DATE MAILED: 12/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,795

Applicant(s)

OLSCHEWSKI ET AL.

Examiner

Lance W. Sealey

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-18 is/are allowed.
- 6) ☒ Claim(s) 1-7,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 8 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit 2671

DETAILED ACTION

Allowed and Allowable Subject Matter

1. Claims 12-18 are allowed, and claims 8 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No prior art anticipates or suggests a method for imaging and measuring microscopic three-dimensional structures, wherein at least one obliquely oriented plane or a set of discrete points is determined in a volume, the at least one obliquely located plane is determined or selected by way of a corresponding graphical drawing tool or an automatic function, and the obliquely oriented plane is marked with a continuous line (claim 8); wherein the selected volume represents a three-dimensional curve; and a scanning microscope is controlled in such a way that only points on the three-dimensional spatial curve are scanned (claim 11); a (separate) second window shown on the display for depicting a rotational view, and a (separate) third window shown on the display for a visual depiction of the coordinates, the rotation angle, and a section position (claim 12). The word “(separate)” has been added by the examiner only to more specifically emphasize what is not being taught by the cited reference; the word “separate” is not part of claim 12. Claims 13-18 are allowed because they depend, directly or indirectly, from claim 12.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth

Art Unit 2671

in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as unpatentable by Hellmuth et al.

("Hellmuth," U.S. Pat. No. 5,795,295) in view of Demandolx et al., "Multicolour analysis and local image correlation in confocal microscopy" ("Demandolx").

4. Hellmuth, in disclosing an oct-assisted surgical microscope with multi-coordinate manipulator, also discloses, with respect to claim 1, a method for imaging and measuring microscopic three-dimensional structures comprising:

- depicting a data set in three-dimensional form on a display associated with a microscope (col.8, ll.13-19);
- defining at least one arbitrary section position and an arbitrary rotation angle (col.11, ll.38-43);
- rotating the three-dimensional depiction on the display until a structure contained in the three-dimensional form reproduces on the display a depiction that appears suitable to the user for further processing (col.11, ll.25-30); and
- performing an analytical measurement operation on the structure (col.14, ll.57-65 state that the resulting correlation function $A(I,J)$ has a maximum value at (row, column) given by (I_{\max}, J_{\max}) , which maximum value corresponds to the best fit between the binary OCT scan data set and the binary diagnostic image data set. The distances between diagnostic image data is known. As a result, the offset between the OCT scan data and the diagnostic image data is $s \cdot I_{\max}$ in the x-direction and $s \cdot J_{\max}$ in the y-direction. The displacement values are then used to shift the diagnostic image data to its true position.

Art Unit 2671

Therefore the offset (length) between the OCT scan data (structure) and the diagnostic image data is shifted to its true position based on (analysis of) the offsets.)

5. However, Hellmuth does not disclose a confocal scanning microscope. This element is disclosed by the Demandolx article at the second column of p.21, first full paragraph.
6. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth microscope in view of the Demandolx microscope. Such a modification to Hellmuth allows for 3D sampling of specimens while excluding out-of-focus blur (Moller, p.23, first paragraph).
7. The other claim in this rejection will now be considered. Concerning claim 6, Hellmuth discloses at least one length to be measured is determined in an imaged volume, the length being defined by a first and a second position and the geometric distance between the two positions representing the desired length (col.10, ll.6-17).
8. Therefore, in view of the foregoing, claims 1 and 6 are rejected as being unpatentable under 35 U.S.C. 103(a) by Hellmuth in view of Demandolx.
9. Claims 2 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hellmuth in view of Demandolx and further in view of Moller et al., Real-Time Rendering ("Moller").
10. Hellmuth further discloses, with respect to claim 2, corresponding section planes calculated upon definition of the section position (col.11, ll.38-43). However, neither Hellmuth nor Demandolx disclose the calculation of a transformation matrix upon definition of the rotation

Art Unit 2671

angle; this concept is disclosed by the Moller textbook in section 3.1.2, pp.26-27.

11. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth-Demandolx microscope apparatus in view of the transformation matrix concept disclosed in Moller. Such a modification to Hellmuth aids in positioning, reshaping and animating objects (Moller, p.23, first paragraph).

12. The other claim in this rejection will now be considered. Concerning claim 3, Moller discloses the corresponding section planes depicted in the display, and the depiction of the sectional geometry is implemented in the form of a wire-frame model made of an outer and an inner cuboid (Figure 6.26 and Section 6.7.3, pp.185-186; the outer cuboid is the outside of the wire-frame box; the inner cuboid is the inside of the wire-frame box).

13. Accordingly, in view of the foregoing, claims 2 and 3 are rejected as being unpatentable under 35 U.S.C. 103 by Hellmuth, Demandolx and Moller.

14. Claims 4 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hellmuth and Demandolx and further in view of Banitt (U.S. Pat. No. 5,963,247) and Lemelson (U.S. Pat. No. 6,400,980).

15. With respect to claim 4, Hellmuth further discloses an “orthosectioning” view assembled in a first window (video monitor **210**, FIG.1) from multiple images each with a different viewing direction (col.11, ll.25-30 and 35-38).

16. However, neither Hellmuth nor Demandolx disclose the images lined up with each other at the corresponding edges; this element is disclosed by the Banitt visual display system in

Art Unit 2671

FIG.2A.

17. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth-Demandolx microscope apparatus in view of the Banitt display. Such a modification to Hellmuth-Demandolx enhances the effect of three-dimensionality (Banitt, col.11, ll.24-33).

18. However, neither Hellmuth, Demandolx nor Banitt disclose crosshairs indicating the current position of the images; this element is disclosed by the crosshairs in the Lemelson display at col.6, ll.50-56.

19. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Banitt display in view of the Lemelson display. Such a modification to Banitt facilitates use of the display (Lemelson, col.6, ll.50-52).

20. The other claim in this rejection will now be considered. Concerning claim 5, Lemelson discloses the position of the images modified interactively by way of the crosshairs by manipulation by means of an input device (col.6, ll.50-52), such that in the individual regions (taught by Hellmuth), the images are updated during modification and the image content is modified accordingly.

21. Accordingly, in view of the foregoing, claims 4 and 5 are rejected as being unpatentable under 35 U.S.C. 103 by Hellmuth, Demandolx, Banitt and Lemelson.

22. Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hellmuth in view of Demandolx and further in view of Drost et al. ("Drost", U.S. Pat. No. 6,538,732).

Art Unit 2671

23. Neither Hellmuth nor Demandolx disclose a user navigating into the plane in which the first position is located, and marks it; the user then navigates into the plane in which the second position is located, and marks it; and based on the first and second position, a PC calculates and visualizes the geometric distance. These elements are disclosed by the Drost inspection system at col.8, ll.4-35).

24. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth-Demandolx microscope in view of the Drost technology. Such a modification to Hellmuth-Demandolx provides the user with measurement of a selected object in the field of view (Drost, col.8, ll.4-5).

25. Accordingly, in view of the foregoing, claim 7 is rejected as being unpatentable under 35 U.S.C. 103 by Hellmuth, Demandolx and Drost.

26. Finally, claims 9-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hellmuth in view of Demandolx and further in view of Rittman, III et al. ("Rittman", U.S. Pat. No. 6,575,969).

27. Neither Hellmuth nor Demandolx disclose, with respect to claim 9, multiple surfaces assembled into a stack that represents a three-dimensional volume, and specific analyses performed on the volume. These elements are disclosed by the Rittman cool-tip radio frequency thermosurgery electrode system for tumor ablation. The stack is disclosed at col.18, ll.9-19, and the analyses are disclosed at col.18, ll.18-26.

28. Therefore, it would have been obvious to one of ordinary skill in the art to have modified

Art Unit 2671

the Hellmuth-Demandolx microscope apparatus in view of the Rittman apparatus. Such a modification to Hellmuth-Demandolx would aid in locating tumors (Rittman, col.18, ll.18-26).

29. The other claim in this rejection will now be considered. Concerning claim 10, Rittman discloses scan parameters applied exclusively to the selected volume (scan parameters="criterion" in col.18, ll.19-20).

30. Accordingly, in view of the foregoing, claims 9-10 are rejected as being unpatentable under 35 U.S.C. 103 by Hellmuth, Demandolx and Rittman.

Response to Remarks

31. The applicants assert that Hellmuth discloses neither a confocal scanning microscope nor performing an analytical operation on the structure of claim 1, specifically the performance of an analytical measurement operation on the structure. Since claim 1 has been amended to add these elements, Hellmuth has been combined with Demandolx, which discloses a confocal scanning microscope, to reject the "confocal scanning microscope" element of claim 1, and extra explanation has been added in the rejection of claim 1 above to show how Hellmuth discloses performing an analytical length measurement operation on the structure of claim 1.

32. The applicants next assert that Hellmuth does not disclose an analytical operation as envisioned by the applicants because the specification discloses, at paragraph 57, an analytical operation as determination of the geometrical length between two positions in an image, not an operation of cutting the brain tissue by observing areas of different contrast, as described in Hellmuth. However, the examiner has applied *In re Donaldson* in giving the claims, not the

Art Unit 2671

specification, their broadest reasonable interpretation, and under a dictionary definition, making a decision as to where to cut brain tissue based on observing areas of different contrast qualifies as an analytical operation.

33. The applicants next argue that Hellmuth does not disclose measurement of a length between two positions in an imaged volume, as required in claim 6. However, in col.10, ll.14-18, optical lengths of OCT radiation are compared, and measurement is inherent in comparing lengths. Furthermore, col.10, ll.40-47 discloses OCT scan data as an image and residing in a volume. Therefore, Hellmuth discloses the claims limitations of claim 6, and is properly rejected along with both the original and amended claims 1. Accordingly, claims 7 and 9-10 are not made allowable because they depend from claims 6 and 1, respectively.

Action is Final, Necessitated by Amendment

34. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

35. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however,

Art Unit 2671

will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the Office should be directed to the examiner, Lance Sealey, whose telephone number is (703) 305-0026. He can be reached from 7:00 am-3:30 pm Monday-Friday EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

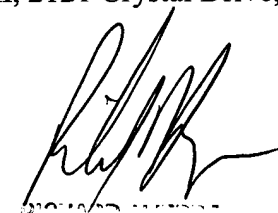
Any response to this action should be mailed to:

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or faxed to:

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Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).


RICHARD H. HIGHT
SUPERVISOR